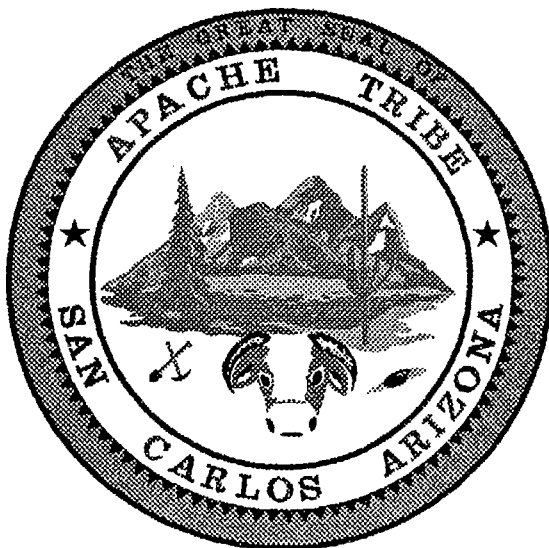


Chapter

**8**

# **ESTIMATE OF DEVELOPMENT COSTS**



## ESTIMATE OF DEVELOPMENT COSTS

*for the Airport Master Plan  
and Environmental Assessment for the  
San Carlos Apache Airport*

### 8.0 CAPITAL IMPROVEMENT PLAN (CIP)

Future development at the San Carlos Apache Airport as included in this study covers a twenty year period. Development items are grouped into three phases. Phase I is short-term (0 - 5 years), Phase II is intermediate-term (5 - 10 years), and Phase III is long-term (10 - 20 years). Preliminary cost estimates based on conceptual layouts are included for each item in the Capital Improvement Program. They are based on the recommended facility requirements discussed in Chapter V and the development alternative selected in Chapter VI. The phasing of projects assists the airport sponsor in budgetary planning for construction improvements which are needed to provide safe and functional facilities for aviation demands. Phased development schedules also assist the airport sponsor in contingencies and construction. The following table assumes the FAA will continue to provide 91.06 percent of the funding for eligible projects in the State of Arizona. Local funding must provide the remaining 8.94 percent of the total cost. The State of Arizona does not currently participate in funding airport development projects on Indian Reservations.

Certain items, such as hangar construction, fuel facilities, and pavement maintenance items must be funded entirely by the Sponsor (or third party sources). Chapter 9, Financial Plan, discusses means of financing the local share.

The proposed capital improvement projects are summarized below. The estimated costs for the proposed projects, along with proposed timeframe, cost share breakdown, and a brief justification, are depicted in Table VIII-2 at the end of this chapter.

- Rehabilitate and strengthen existing apron and taxiway.
- Remove the existing runway and construct a new runway located 100 feet to the south. Construct the new runway 100 feet by 6,500 feet initially, then extend to 8,500 feet.
- Expand aircraft parking apron and construct taxilanes to the future T-hangar area.

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## 8.1 PAVEMENT MAINTENANCE PLAN

Periodic maintenance is necessary to prolong the useful life of the airport pavements. The affects of weather damage, oxidation, and aircraft passes cause the pavement to deteriorate. The accumulation of moisture in the pavement causes heaving and cracking and is one of the greatest causes of pavement distress. The sun's ultraviolet rays oxidize and break down the asphalt binder in the pavement mix. This accelerates ravelling and erosion and can reduce asphalt thickness.

The appropriate pavement maintenance will minimize the affects of weather damage and oxidation. Crack sealing is accomplished to keep moisture from accumulating inside and underneath the pavement and should be accomplished at least every five years, and prior to fog sealing or overlaying the pavements. Fog seals, slurry seals, and coal tar emulsion (fuel resistant) seals are spread over the entire paved area to replenish the binder lost through oxidation and to seal, rejuvenate, and waterproof the pavement. Slurry seals also include an aggregate to increase the friction coefficient of the pavement. Asphalt overlays are accomplished near the end of the useful life of the pavement. A layer of new asphalt is placed over the existing pavement to renew the life of the pavement and to recover lost strength due to deterioration. Unless specially designed, the overlay is not intended to increase the weight bearing capacity of the pavement. Overlays may be supplemented with a porous friction course or grooving to increase friction and minimize hydroplaning. Remarkings of the pavement is required following a fog seal or overlay.

The recommended pavement maintenance cycle time frames are listed below. It should be noted that the time frames are recommendations only. Actual pavement deterioration will be affected by use of the airport and weather exposure. Maintenance actions should be programmed as necessary through close monitoring and inspection of the pavements.

### Pavement Maintenance Cycle (Approximate Time Frames):

- Crack Seal Pavement (0-5 Years)
- Crack Seal and Fog Seal Pavement (5-10 Years)
- Overlay Pavement (15-18 Years)

**FIGURE VIII-1  
CAPITAL IMPROVEMENT PLAN**

YEAR	DESCRIPTION	TOTAL COST	FAA	LOCAL	JUSTIFICATION
1998	Grading and Drainage for New Runway 9/27 (Including channel relocation)	\$2,103,000	\$1,914,992	\$188,008	Needed to accommodate existing and forecasted aircraft.
1998	Install Wildlife/Security Fencing	\$122,000	\$111,093	\$10,907	Protects against inadvertent access onto airport by people or animals.
1998	Overlay/Strengthen Existing Taxiway and Apron (60,000 lbs. DWG)	\$240,000	\$218,544	\$21,456	Needed to rehabilitate and strengthen pavement to accommodate existing and forecasted aircraft.
1998	Pave New Runway 9/27 100' x 6500', Taxiway Extension and Connector Taxiways (60,000 lbs. DWG)	\$2,178,000	\$1,983,287	\$194,713	Needed to accommodate existing and forecasted aircraft.
1999	Light & Sign Runway and Taxiway	\$443,000	\$403,396	\$39,604	Enhances safety and efficiency of aircraft operations.
1999	Install PAPIs, REILs, and AWOS	\$192,000	\$174,835	\$17,165	Enhances safety and efficiency of aircraft operations.
1999	Expand Aircraft Parking Apron (5,600 S.Y.) and Construct Taxilanes to T-Hangar Area	\$324,000	\$295,034	\$28,966	Needed to accommodate existing and forecasted aircraft parking and storage demand.
2000	Environmental Assessment for Runway Extension	\$50,000	\$45,530	\$4,470	Required for runway extension.
2001	Extend Runway 9/27 and Parallel Taxiway to 8,500' (Inc. Lighting, Signage, & Marking)	\$1,139,000	\$1,037,173	\$101,827	Needed to accommodate forecasted aircraft takeoff length requirements.
2002	Update Airport Layout Plan	\$50,000	\$45,530	\$4,470	Needed to review existing conditions, revise aviation forecasts, and update improvement plans.
<b>TOTAL Phase I (0 to 5 Years)</b>		<b>\$6,841,000</b>	<b>\$6,229,415</b>	<b>\$611,585</b>	
2003	Crack & Fog Seal Airfield Pavements (130,000 S.Y.)	\$100,000	\$0	\$100,000	Needed to maintain existing airfield pavements.
2004	Install 20 Sunshades	\$140,000	\$0	\$140,000	Needed to accommodate forecasted aircraft storage demand.

**FIGURE VIII-1  
CAPITAL IMPROVEMENT PLAN**

YEAR	DESCRIPTION	TOTAL COST	FAA	LOCAL	JUSTIFICATION
2007	Update Airport Master Plan	\$75,000	\$68,295	\$6,705	Needed to review existing conditions, revise aviation forecasts, and update improvement plans.
	<b>TOTAL Phase II (6 to 10 Years)</b>	<b>\$315,000</b>	<b>\$68,295</b>	<b>\$246,705</b>	
2008	Crack & Fog Seal Airfield Pavements (130,000 S.Y.)	\$100,000	\$0	\$100,000	Needed to maintain existing airfield pavements.
2012	Construct Executive Terminal and Maintenance Facility	\$1,000,000	\$0	\$1,000,000	Needed to accommodate increased demand.
2015	Overlay airfield Pavements (130,000 S.Y.)	\$775,000	\$705,715	\$69,285	Needed to maintain existing airfield pavements.
	<b>TOTAL PHASE III (11 to 20 Years)</b>	<b>\$1,875,000</b>	<b>\$705,715</b>	<b>\$1,169,285</b>	
	<b>TOTAL (20 Year Planning Period)</b>	<b>\$9,031,000</b>	<b>\$7,003,425</b>	<b>\$2,027,575</b>	
<i>All cost estimates shown in 1997 dollars.</i>					